

[0049] Another example geared architecture 148 for the engine 120 is shown in FIG. 3. The engine static structure 136 supports the inner and outer shafts 140, 150 for rotation about the axis A. The outer shaft 150 supports the high pressure compressor section 152 and the high pressure turbine section 154, which is arranged upstream from the mid turbine frame 159.

[0050] The inner shaft 140 is coupled to the geared architecture 148, which is an epicyclic gear train 160 configured in a differential arrangement. The gear train 160 includes planetary gears 164 supported by a carrier 162, which is connected to the inner shaft 140 that supports the low pressure turbine 146. A sun gear 166 is centrally arranged relative to and intermeshes with the planetary gears 164. A ring gear 170 circumscribes and intermeshes with the planetary gears 164. In the example, a fan shaft 172, which is connected to the fan 142, is rotationally fixed relative to the ring gear 170. The low pressure compressor 144 is supported by a low pressure compressor rotor 168, which is connected to the sun gear 166 in the example.

[0051] The carrier 162 is rotationally driven by the low pressure turbine 146 through the inner shaft 140. The planetary gears 164 provide the differential input to the fan shaft 172 and low pressure compressor rotor 168 based upon the geometry ratio. The geared architecture 148 includes an additional speed change device 74 interconnecting the inner shaft 140 and the gear train 160. Higher low pressure turbine section rotational speeds are attainable with the additional speed change device 74, enabling the use of fewer turbine stages in the low pressure turbine section. The speed change device 74 may be a geared arrangement and/or a hydraulic arrangement for reducing the rotational speed from the low pressure turbine section 146 to the fan 142 and low pressure compressor section 144.

[0052] Another example geared architecture 248 for the engine 220 is shown in FIG. 4. The engine static structure 236 supports the inner and outer shafts 240, 250 for rotation about the axis A. The outer shaft 250 supports the high pressure compressor section 252 and the high pressure turbine section 254, which is arranged upstream from the mid turbine frame 259.

[0053] The inner shaft 240 is coupled to the geared architecture 248, which is an epicyclic gear train 260 configured in a differential arrangement. The gear train 260 includes planetary gears 264 supported by a carrier 262, which is connected to the inner shaft 240 that supports the low pressure turbine 246. A sun gear 266 is centrally arranged relative to and intermeshes with the planetary gears 264. A ring gear 270 circumscribes and intermeshes with the planetary gears 264. In the example, a fan shaft 272, which is connected to the fan 242, is rotationally fixed relative to the ring gear 270. The low pressure compressor 244 is supported by a low pressure compressor rotor 268, which is connected to the sun gear 266 in the example.

[0054] The carrier 262 is rotationally driven by the low pressure turbine 246 through the inner shaft 240. The planetary gears 264 provide the differential input to the fan shaft 272 and low pressure compressor rotor 268 based upon the geometry ratio. The geared architecture 248 includes an additional speed change device 274 interconnecting the inner shaft 240 and the gear train 260.

[0055] An inducer 76 is fixed for rotation relative to the ring gear 270. The inducer 76 is arranged in the core flow path C to provide some initial compression to the air before entering

the low pressure compressor section 244. The inducer 76 rotates at the same rotational speed as the fan 242 and provides some additional thrust, which is useful in hot weather, for example, where engine thrust is reduced.

[0056] Another example geared architecture 348 for the engine 320 is shown in FIG. 5. The engine static structure 336 supports the inner and outer shafts 340, 350 for rotation about the axis A. The outer shaft 350 supports the high pressure compressor section 352 and the high pressure turbine section 354, which is arranged upstream from the mid turbine frame 359.

[0057] The inner shaft 340 is coupled to the geared architecture 348, which is an epicyclic gear train 360 configured in a differential arrangement. The gear train 360 includes planetary gears 364 supported by a carrier 362, which is connected to the inner shaft 340 that supports the low pressure turbine 346. A sun gear 366 is centrally arranged relative to and intermeshes with the planetary gears 364. A ring gear 370 circumscribes and intermeshes with the planetary gears 364. In the example, a fan shaft 372 is connected to the fan 342. The low pressure compressor 344 is supported by a low pressure compressor rotor 368, which is rotationally fixed relative to the ring gear 370 in the example.

[0058] The carrier 362 is rotationally driven by the low pressure turbine 346 through the inner shaft 340. The planetary gears 364 provide the differential input to the fan shaft 372 and low pressure compressor rotor 368 based upon the geometry ratio. The geared architecture 348 includes an additional speed change device 374 interconnecting the inner shaft 340 and the gear train 360. The speed change device 374 receives rotational input from the sun gear 366 and couples the fan shaft 372 to the gear train 360, which enables slower fan speeds.

[0059] Another example geared architecture 448 for the engine 420 is shown in FIG. 6. The engine static structure 436 supports the inner and outer shafts 440, 450 for rotation about the axis A. The outer shaft 450 supports the high pressure compressor section 452 and the high pressure turbine section 454, which is arranged upstream from the mid turbine frame 459.

[0060] The inner shaft 440 is coupled to the geared architecture 448, which is an epicyclic gear train 460 configured in a differential arrangement. The gear train 460 includes planetary gears 464 supported by a carrier 462, which is connected to the inner shaft 440 that supports the low pressure turbine 446. A sun gear 466 is centrally arranged relative to and intermeshes with the planetary gears 464. A ring gear 470 circumscribes and intermeshes with the planetary gears 464. In the example, a fan shaft 472 is connected to the fan 442. The low pressure compressor 444 is supported by a low pressure compressor rotor 468, which is rotationally fixed relative to the ring gear 470 in the example.

[0061] The carrier 462 is rotationally driven by the low pressure compressor 446 through the inner shaft 440. The planetary gears 464 provide the differential input to the fan shaft 472 and low pressure compressor rotor 468 based upon the geometry ratio. The geared architecture 448 includes an additional speed change device 474 interconnecting the inner shaft 440 and the gear train 460. The speed change device 474 receives rotational input from the sun gear 466 and couples the fan shaft 472 to the gear train 460, which enables slower fan speeds.

[0062] The inducer 476 is fixed for rotation relative to the fan shaft 472. The inducer 476 is arranged in the core flow